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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/674,055

09/30/2003

Toshihiko Ohmori

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12/10/2004

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EXAMINER

THOMPSON, TIMOTHY J

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/674,055

Applicant(s)

OHMORI ET AL.

Examiner

Timothy J Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13, 14, 17 and 20 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 15, 16, 18, 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al.(U.S. Pat. No. 6,784,961).

Regarding claim 1, Suzuki et al. discloses a light source(fig 1, 12) which irradiates illumination light on a spatial light modulator(fig 1, 30); and an optical integrator(fig 1, 14, 15) which is placed between the light source and the spatial light modulator and uniformizes an intensity distribution of the illumination light by passing light through optical elements(fig 1); the diagonal lengths of the optical integrator are 4 mm or less(col 1, lines 37-60).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker et al.(U.S. Pat. No. 6,224,216).

Regarding claim 1, Parker et al. discloses a light source(fig 2, 32) which irradiates illumination light on a spatial light modulator(fig 2, 44); and an optical integrator(fig 2, 40) which is placed between the light source and the spatial light modulator and uniformizes an intensity distribution of the illumination light by passing light through optical elements(fig 2). Parker et al. does not specifically disclose diagonal lengths of the optical integrator are 4 mm or less. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the diagonal lengths of the optical integrator 4 mm or less, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 2, Parker et al. does not specifically disclose Etendue of the light source is not more than 1 mm str. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the Etendue of the light source to be not more than 1 mm str., since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 3, Parker et al. discloses a laser(col 5, lines 45-47) and an optical fiber(fig 3, 76) for propagating laser emitted from the laser therethrough and emitting the laser light(fig 3, 76).

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Regarding claim 4, Parker et al. discloses the light source has a constitution in which multiplexing of a plurality of lasers(col 5, lines 45-47) is performed by making the lasers incident on one optical fiber and a plurality of the optical fibers are further arranged to form a bundle(fig 3, 76).

Regarding claim 5, Parker et al. discloses the spatial light modulator is a DMD(fig 2, 44).

Regarding claim 6, Parker et al. discloses the spatial light modulator is a DMD(fig 2, 44).

Regarding claim 7, Parker et al. discloses the spatial light modulator is a DMD(fig 2, 44).

Regarding claim 8, Parker et al. discloses the spatial light modulator is a DMD(fig 2, 44).

Claims 1, 2, 5, 6, 9, 10, 13, 14, 17, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zinn et al.(U.S. Pat. Pub. No. 2004/0057034).

Regarding claim 1, Zinn et al. discloses a light source(fig 3, 312) which irradiates illumination light on a spatial light modulator(fig 3, 332); and an optical integrator(fig 3, 324) which is placed between the light source and the spatial light modulator and uniformizes an intensity distribution of the illumination light by passing light through optical elements(fig 3). Parker et al. does not specifically disclose diagonal lengths of the optical integrator are 4 mm or less. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the diagonal lengths

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of the optical integrator 4 mm or less, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 2, Zinn et al. does not specifically disclose Etendue of the light source is not more than 1 mm str. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the Etendue of the light source to be not more than 1 mm str., since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 5, Zinn et al. discloses the spatial light modulator is a DMD(fig 2, 44).

Regarding claim 6, Zinn et al. discloses the spatial light modulator is a DMD(fig 2, 44).

Regarding claim 9, Zinn et al. discloses the spatial light modulator based on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light(fig 6 and fig 3, 334).

Regarding claim 10, Zinn et al. discloses the spatial light modulator based on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light(fig 6 and fig 3, 334).

Regarding claim 13, Zinn et al. discloses by the spatial light modulator based

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on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light(fig 6 and fig 3, 334).

Regarding claim 14, Zinn et al. discloses by the spatial light modulator based on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light(fig 6 and fig 3, 334).

Regarding claim 17, Zinn et al. discloses the spatial light modulator based on a predetermined image signal; and exposing a photosensitive material with an image formed by this modulated illumination light(fig 6 and fig 3, 334).

Regarding claim 20, Zinn et al. discloses the spatial light modulator based on a predetermined image signal; and exposing a photosensitive material with an image formed by this modulated illumination light(fig 6 and fig 3, 334).

### ***Allowable Subject Matter***

Claims 11, 12, 15, 16, 18, 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With the allowable features being a laser with an optical fiber is used in the exposure apparatus.

### **Conclusion**

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Thompson whose telephone number is (571) 272-2342. If the examiner can not be reached his supervisor, Georgia Epps, can be reached on (571) 272-2328.

T.J.T.

12/6/04

9. An exposure device having a constitution in which illumination light emitted from the illumination optical system of claim 1 is modulated by the spatial light modulator based on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light.

10. An exposure device having a constitution in which illumination light emitted from the illumination optical system of claim 2 is modulated by the spatial light modulator based on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light.



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An exposure device having a constitution in which illumination light emitted from the illumination optical system of claim 3 is modulated by the spatial light modulator based 20 on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light.

An exposure device having a constitution in which illumination light emitted from the illumination optical system 25 of claim 4 is modulated by the spatial light modulator based on a predetermined image signal and exposure of a photosensitive material is performed with an image formed illumination light.

by this modulated

An exposure device having a constitution in which illumination light emitted from the illumination optical system 5 of claim 5 modulated by the spatial light modulator based on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light.

An exposure device having a constitution in which 10 illumination light emitted from the illumination optical system

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of claim 6 is modulated by the spatial light modulator based on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated illumination light.

15 An exposure

device having a constitution in which

illumination light emitted from the illumination optical system

of claim 7 is modulated by the spatial light modulator based

on a predetermined image signal and exposure of a photosensitive material is performed with an image formed by this modulated

20 illumination light.

16. An exposure device having a constitution in which

illumination light emitted from the illumination optical system

of claim 8 is modulated by the spatial light modulator based

on a predetermined image signal and exposure of a photosensitive

25 material is performed with an image formed by this modulated illumination light.

an exposure method

comprising the steps

modulating illumination light emitted by the illumination

optical system defined in claim 1 with the spatial light modulator

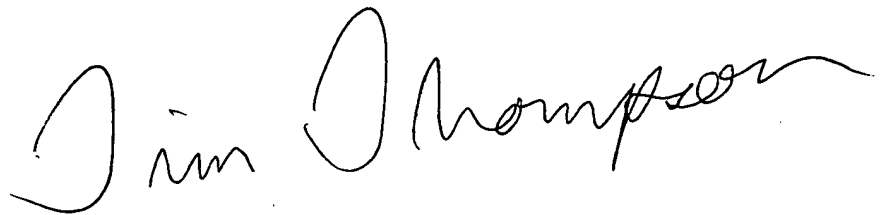
based on a predetermined image signal; and

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Thompson whose telephone number is (571) 272-2342. If the examiner can not be reached his supervisor, Georgia Epps, can be reached on (571) 272-2328.

T.J.T.

12/6/04

A handwritten signature in black ink that reads "Tim Thompson". The signature is written in a cursive, flowing style.

**TIMOTHY THOMPSON  
PRIMARY EXAMINER**